CLAIMS

1.   A print engine/controller configured to be coupled with other similar print engine/controllers to drive an ink drop printhead comprising:

an interface at which to receive compressed page data;

image decoders to decode compressed image planes in the received compressed page data;

a half-toner/compositer to composite respective strips of the decoded image planes by halftoning a contone layer to a bi-level version and compositing a spot1 bi-level layer over an appropriate halftoned contone layer; and

a printhead interface to output the composite strip to a printhead

the printhead interface including:

a multi-segment printhead interface outputting printhead formatted data; and

a synchronization signal generator.

2.   The print engine/controller of claim 1, wherein:

the half-toner/compositer is adapted to map K to CMY dots when there is no K ink in a printer.

3.   The print engine/controller of claim 1, wherein:

the a half-toner/compositer selects between two dither matrices on a pixel by pixel basis based on a corresponding value in a dither matrix select map.

4.   The print engine/controller of claim 1, wherein:

the half-toner/compositer has as an input, an expanded contone layer, an expanded bi-level spot1 layer, an expanded dither-matrix-select bitmap and tag data.

5.   The print engine/controller of claim 4, wherein:

the tag data is at full dot resolution.

6.   The print engine/controller of claim 1, wherein:

the a half-toner/compositer selects between two dither matrices on a pixel by pixel basis based on a corresponding value in a dither matrix select map.

7.   The print engine/controller of claim 1, wherein:

the half-toner/compositor includes a margin unit to apply margin data to the respective image planes during the composite process to generate print data in strips.

8.   The print engine/controller of claim 1, wherein:

the halftoner/compositor scales input image planes under control of a margin unit set to establish print data for a strip of the image.

9.   The print engine/controller of claim 1, wherein:

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the half-toner/compositor further comprises a number of scale units, each scale unit receiving data from a buffer layer and at least one scale unit receiving two control bits, the control bits being an advance dot bit and an advance line bit.

5   10.   The print engine/controller of claim 9, wherein:

the advance dot bit allows for the generation of multiple instances of identical dot data and the advance line bit provides for truncation of data according to a printer margin.

11.   The print engine/controller of claim 9, wherein:

10   the buffer layers comprise contone layers, a bi-level spot1 layer and a dither select matrix layer, each of which may be scaled independently.

12.   The print engine/controller of claim 11, further comprising:

a bi-level tag data buffer which does not require scaling.

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13.   The print engine/controller of claim 9, further comprising:

a compositing stage for a number of output layers, the compositing stage having for an output layer, a single dot merger unit with inputs equal in number to the number of output layers.

20   14.   The print engine/controller of claim 13, further comprising:

a dot reorg unit which takes a generated dot stream for a given color plane and organizes it into fixed length quantities so that an output of the half-toner/compositor is in segment order and not in dot order within segments.

25   15.   The print engine/controller of claim 13, wherein:

the dot reorg unit is adapted to receive a dot advance signal from a dither matrix access unit as an instruction as to which bit to output.

16.   The print engine/controller of claim 10, further comprising:

30   a margin unit for turning the advance dot and advance line signals into general control signals based on a page margin of a current page.

17.   The print engine/controller of claim 16, wherein:

the margin unit also generates an end of page condition and keeps a counter for dot and line across

35   a page.

18.   The print engine/controller of claim 17, wherein:

the dot counter is advanceable by 1 each time the margin unit receives a dot advance signal and re-settable to zero when the margin unit receives a line advance signal.

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19.   The print engine/controller of claim 1, further comprising:

a line loader/format unit for receiving dot information from the half-toner/compositor and loading dots for a given print line into an appropriate buffer storage, formatting them into an order required by a printhead.

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